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Medical Students' Comfort Levels With Performing the Basic Head and Neck Examination in Practice: Follow-up During the Core Clerkship Year

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OBJECTIVE: Following our preliminary study on junior medical students' comfort levels in performing the head and neck physical examination (H&NPE) before and after a department-led teaching session, we assessed the longitudinal effect of this session on students during the core clinical clerkship year, in which these skills were performed on real patients.

DESIGN: Anonymous cross-sectional survey study as a follow-up to previous intervention.

METHODS: Overall, 101 and 90 second-year medical students participated in an H&NPE teaching session 1 year before the current survey administration in 2 consecutive years. The same cohorts of students, as third years, were asked to rate their comfort levels (0-5-point Likert scale) in performing the H&NPE and the importance of otolaryngology rotations in medical school and primary care residency training.

RESULTS: Of the 101 and 90 students, 53 and 46 medical students completed the follow-up survey in each respective year. For both classes, compared with before the teaching session, students reported an average comfort level of 2.8 (somewhat to moderately comfortable) in performing the complete H&NPE ($p < 0.0001$) during the core clinical clerkship year. Similar changes were observed for the individual ear, nose, mouth, and neck components of the examination (all p 's < 0.0002). Students at follow-up reported statistically similar comfort levels when compared with immediately after the teaching session for the ear, oral cavity, and neck examinations.

CONCLUSION: The initial teaching session persistently improved medical students' comfort levels in performing the H&NPE, with some attrition in comfort levels with performing the nasal examination and complete H&NPE. An otolaryngologist-directed, practical educational intervention may permanently reinforce the acquisition of complex skills such as the H&NPE. (J Surg 72:117-121. © 2014 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: general otolaryngology, head and neck examination, medical education

COMPETENCIES: Patient Care, Medical Knowledge, Practice-Based Learning and Improvement, Interpersonal and Communication Skills

INTRODUCTION

Otolaryngologic problems comprise a significant proportion of common medical visits.^{1,2} However, coverage of otolaryngologic problems is relatively deficient in undergraduate medical education³⁻⁶ and primary care graduate education,⁷⁻¹⁰ though such problems are routinely encountered in training and practice. As such, it is important for otolaryngologists to actively close the knowledge and skills gap for medical students and primary care resident physicians who will encounter such medical problems. One method is through a department-led, supervised, practical head and neck physical examination (H&NPE) teaching session. Our previous study provided preliminary results on junior medical students' comfort levels toward performing elements of and the complete H&NPE, as well as their exposure to and attitudes toward otolaryngology, before and after our annual department-led teaching session.¹¹ The results were very

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encouraging—a coordinated H&NPE teaching session, in which medical students were taught basic H&NPE examination skills by resident and faculty physicians followed by practice on student partners, was not only well received as an effective and interesting teaching tool, but it also served to significantly increase students' comfort levels in performing this complex examination. The session secondarily introduced medical students to the specialty of otolaryngology and helped them realize the importance and predominance of otolaryngologic complaints in primary care medicine.

Although the gains immediately following a teaching session may appear inflated because of the timing of the training session, we were interested in the change in comfort levels over time as these students progressed to the core clinical clerkship year, during which they would be performing the H&NPE routinely on actual patients. Studies have documented that students learning from real patients acquire complex skills and develop enhanced confidence in their abilities, thus reinforcing skills learned from didactics.¹² At the University of California Irvine School of Medicine, third-year medical students participate in required core clinical clerkships in the following specialties: internal medicine, ambulatory medicine, general surgery (with brief exposure to various surgical subspecialties), pediatrics, obstetrics and gynecology, psychiatry, and family medicine. It is our belief that each of these clerkships provides exposure to otolaryngologic issues, offers some opportunity for students to perform the H&NPE (some more frequently than others) and, at the same time, shapes their attitudes toward the role of otolaryngology in medicine. With consideration of both students' previously learned H&NPE skills and newly acquired clinical experiences, we present the 1-year follow-up results from our original study cohort. The goal of the current follow-up study is to assess the longitudinal effect of a H&NPE teaching session conducted before the core clinical clerkship year on students' comfort levels in performing the H&NPE on real patients during their clinical rotations.

METHODS

This study was approved by the institutional review board of the University of California, Irvine. The H&NPE teaching session and the contents of the presession and postsession surveys are extensively discussed in our preliminary study.¹¹ Similar to the previous 2 surveys, the 1-year follow-up survey asked students to rate their current comfort levels in performing elements of and the complete H&NPE, the helpfulness of the second-year teaching session in improving H&NPE comfort levels, and the relevance of a mandatory otolaryngology rotation for medical students and primary care resident physicians. Once again, the survey solicited the length of time that students felt was necessary to be able to learn to perform a skillful

H&NPE. All ratings were based on a 5-point Likert scale, with 5 being the highest rating and 0 the lowest.

RESULTS

Of the 101 and 90 second-year medical students to complete the H&NPE session in 2009 and 2011, 95 and 89 completed presurveys, 77 and 69 completed postsurveys, 53 and 46 students completed the follow-up survey a year later, during their core clerkship year, yielding response rates of 52.5% and 51.1%, respectively. The Figure illustrates the timing of each survey administration and the response rate for each survey administration.¹¹ The mean Likert rating scores were compared between presurveys and follow-up surveys, as well as between postsurveys and follow-up surveys, using an unpaired, 2-tailed Student *t* test with a significance level of 0.05.¹¹ These results are summarized in the Table. All 1-year follow-up comfort levels were statistically higher than comfort levels reported before the teaching session ($p < 0.0001$). Statistically significant differences in comfort levels were observed between the postsurvey and 1-year follow-up survey for the nasal examination ($p = 0.006$ and $p < 0.0001$) and complete H&NPE ($p = 0.003$ and $p = 0.004$), whereas no differences were observed with the ear/otoscopic, oral cavity, and neck examinations ($p > 0.05$).

The initial teaching session was rated as moderately helpful (2.8). Students rated the relevance of a mandatory medical school rotation in otolaryngology as 2.3, decreasing from 2.8 ($p = 0.03$) and 3.3 ($p < 0.0001$) from the presurveys and postsurveys, respectively. They rated the relevance of a mandatory primary care residency rotation in otolaryngology as 3.0, statistically unchanged from 3.2 ($p = 0.39$) and 3.3 ($p = 0.11$) from the presurveys and postsurveys, respectively. Of the students, 56% believed that 2 weeks was sufficient in learning to perform a skillful H&NPE; the distribution of responses was not different among presurveys, postsurveys, and follow-up surveys ($p = 0.58$, single-factor analysis of variances).

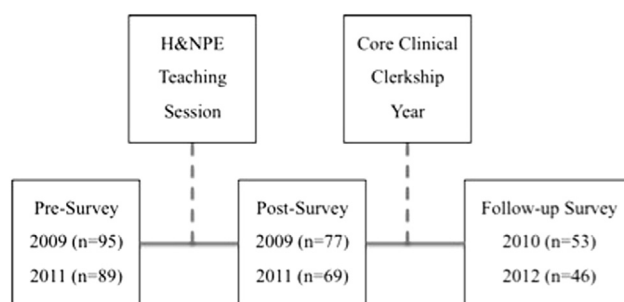


FIGURE. Timing of head and neck examination teaching session, survey administrations, and corresponding numbers of survey respondents.

TABLE. Medical Students' Comfort Levels in Performing the Head and Neck Examination Before and After the Training Session

	Presurvey		Postsurvey		Follow-up Survey
	Average	p Value	Average	p Value	Average
How comfortable do you feel performing an entire head and neck examination?					
Class of 2012	2.126	<0.0001	3.363	0.0025	2.867
Class of 2014	2.033	0.001	3.463	0.0043	2.760
How comfortable do you feel performing a physical examination of the ear (i.e., using an otoscope)?					
Class of 2012	2.473	<0.0001	3.415	0.5006	3.301
Class of 2014	2.255	<0.0001	3.681	0.177	3.326
How comfortable do you feel examining the nose and nasal cavity?					
Class of 2012	1.978	<0.0001	3.116	0.0061	2.660
Class of 2014	1.533	<0.0001	3.449	<0.0001	2.434
How comfortable do you feel performing an oral examination (including tongue examination)?					
Class of 2012	1.915	<0.0001	3.272	0.2332	3.075
Class of 2014	1.988	<0.0001	3.623	0.0629	3.130
How comfortable do you feel examining the neck?					
Class of 2012	2.126	<0.0001	3.415	0.1366	3.169
Class of 2014	2.177	0.0002	3.492	0.0683	3.021

DISCUSSION

As health reform shifts toward increased access to health care, the role of nonotolaryngologist physicians, chiefly primary care physicians, in managing otolaryngologic problems will likely increase. It thus becomes extremely important for all medical students and primary care medical residents to become familiar with these issues and especially how to perform a complete H&NPE as a starting point in the workup process. Though otolaryngologists may devote significant time to teaching these skills, the long-term effect of such a teaching session has not been assessed. To our knowledge, our study is the first of its kind to systematically evaluate the immediate and long-term effects of a structured H&NPE teaching session for medical students.

It appears that, from this follow-up study, the original H&NPE teaching session served at least a supplemental role in boosting students' comfort levels in performing the H&NPE. Students in general seemed to retain comfort in performing the ear, oral cavity, and neck examinations, as these maneuvers are commonly performed in core third-year primary care rotations (i.e., pediatrics, family medicine, and internal medicine), which many respondents have already rotated through and which all students are required to complete. In contrast, the nasal examination taught from an otolaryngologist's perspective is more specialized, requiring instruments not commonly found in primary care offices (e.g., nasal speculum). Furthermore, junior medical students and primary care physicians often use an otoscope in place of specialized tools for examination of the nose.¹³

We also expect some attrition in comfort levels with performing the complete H&NPE for the same reason (i.e., specialized equipment). In fact, with the exception of certain specialties, which require specific examination maneuvers (e.g., otoscopic examination in pediatrics), additional attrition across all examination components may be expected as a function of time elapsed since initial teaching.

With a specialized skill such as physical examination, there is always some expected variation in interpretation of findings, which may appear as variation in comfort levels or skill competency.^{14,15} This is generally attributed to normal anatomic variation and discrepancies in examination interrater reliability. The latter appears to be a persistent confounding variable even among otolaryngologists,¹⁶⁻¹⁸ which underscores the importance of concurrently taking both a good patient history and examination findings into consideration to properly guide patient management.

Students in the follow-up study rated the importance of a mandatory otolaryngology rotation for medical students as lower than what they reported previously. It is possible that, as students rotate through the core clerkship year, they develop specific career direction and begin choosing specialties, thus perceiving an otolaryngology rotation as less relevant to their future career or "cutting into" elective time devoted to learning about their chosen specialty. Yet students continue to realize the utility of a mandatory otolaryngology rotation for primary care resident physicians, as otolaryngologic problems play a large role in primary care complaints (as much as 30%-60%)^{1,2,19,20} but are not adequately covered in medical school curricula.^{5,9,10}

There are several limitations to this study. First, there continued to be significant attrition between survey administrations. With the boom of Internet communication, medical professionals receive tens to hundreds of e-mails each day, including a large number of survey requests. This exponential increase in the number of electronic survey requests is likely attributed to reduced costs and ease of mass dispersion.^{21,22} Furthermore, adjusting to the relatively more demanding schedule during the core clerkship year often precludes devoting adequate time to voluntary, non-essential activities such as completing surveys. We thus recognize the importance of persistent and clear communication to students regarding the value of the study findings.

Of note, the responders and nonresponders were among the same cohort who underwent the training session in 2009 and 2011 and are thus not expected to respond to the survey differently beyond their individual self-assessment of comfort levels in performing elements of the H&NPE. Second, students complete clerkships in different orders as they cycle through required rotations. This means some students likely have had more opportunities to gain practical examination experience depending on the rotations completed (e.g., otoscopic examinations in pediatrics). For this reason, and owing to the possibility of selection bias, we also elected to not solicit the number of H&NPEs performed by each student. We considered administering the survey at the end of the third year but anticipated a much lower response rate owing to students' new priorities in preparing for residency applications. Third, though the current follow-up provides valuable insight into the long-term effectiveness of the teaching session, assessing students' comfort levels in performing the H&NPE as resident physicians would potentially afford additional credibility.

CONCLUSION

The H&NPE can only be mastered through repeated practice on real patients. The results of this study provide insight on the long-term effectiveness of a practical "primer" for learning the complex H&NPE and secondarily play a role in helping medical students get acquainted with the importance of otolaryngology in primary care medicine. As the U.S. health system continues to address the need for primary care physicians, more medical students will enter primary care specialties.²³ Although competency in the H&NPE and knowledge of otolaryngologic problems is currently deemphasized in medical school curricula, students appear to realize its importance and respond very positively to efforts to instruct them on these topics and skills. Thus, an otolaryngologist-directed educational intervention in the form of a department-led teaching session may have a significant effect on medical student acquisition of integral but complex clinical skills such as the H&NPE and introduce them to the relevance of otolaryngology in clinical medicine and especially primary care medicine.

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REFERENCES

1. Hannaford PC, Simpson JA, Bisset AF, Davis A, McKerrow W, Mills R. The prevalence of ear, nose and throat problems in the community: results from a national cross-sectional postal survey in Scotland. *Fam Pract.* 2005;22(3):227-233.
2. Vasileiou I, Giannopoulos A, Klonaris C, et al. The potential role of primary care in the management of common ear, nose or throat disorders presenting to the emergency department in Greece. *Qual Prim Care.* 2009;17(2):145-148.
3. Powell J, Cooles FA, Carrie S, Paleri V. Is undergraduate medical education working for ENT surgery? A survey of UK medical school graduates *J Laryngol Otol.* 2011;125(9):896-905.
4. Doshi J, Carrie S. A survey of undergraduate otolaryngology experience at Newcastle University Medical School. *J Laryngol Otol.* 2006;120(9):770-773.
5. Wong A, Fung K. Otolaryngology in undergraduate medical education. *J Otolaryngol Head Neck Surg.* 2009;38(1):38-48.
6. Campisi P, Asaria J, Brown D. Undergraduate otolaryngology education in Canadian medical schools. *Laryngoscope.* 2008;118(11):1941-1950.
7. Hu A, Sardesai MG, Meyer TK. A need for otolaryngology education among primary care providers. *Med Educ Online.* 2012;17:17350.
8. Domanski MC, Ashktorab S, Bielamowicz SA. Primary care perceptions of otolaryngology. *J Otolaryngol Head Neck Surg.* 2010;143(3):337-340.
9. Glicksman JT, Brandt MG, Parr J, Fung K. Needs assessment of undergraduate education in otolaryngology among family medicine residents. *J Otolaryngol Head Neck Surg.* 2008;37(5):668-675.
10. Carr MM, Brown DH, Reznick RK. Needs assessment for an undergraduate otolaryngology curriculum. *J Otolaryngol Head Neck Surg.* 1999;120(6):865-868.
11. Wu EC, Passy V, Armstrong WB. Preliminary evaluation of junior medical students' exposure and comfort with performing the basic head and neck examination. *Laryngoscope.* 2011;121(7):1431-1435.
12. Bell K, Boshuizen HP, Scherpbier A, Dornan T. When only the real thing will do: junior medical students' learning from real patients. *Med Educ.* 2009;43(11):1036-1043.
13. Bickley LS, Szilagyi PG. Bates' Guide to Physical Examination and History Taking. 10th ed Philadelphia: Lippincott Williams & Wilkins; 2009.
14. Lippa LM, Boker J, Duke A, Amin A. A novel 3-year longitudinal pilot study of medical students'

- acquisition and retention of screening eye examination skills. *Ophthalmology*. 2006;113(1):133-139.
15. Mangione S, Nieman LZ. Cardiac auscultatory skills of internal medicine and family practice trainees. A comparison of diagnostic proficiency. *J Am Med Assoc*. 1997;278(9):717-722.
 16. Smith TL, Hwang PH, Murr AH, Lavigne F, Koreck A. Interrater reliability of endoscopic parameters following sinus surgery. *Laryngoscope*. 2012;122(1):230-236.
 17. McCoul ED, Smith TL, Mace JC, et al. Interrater agreement of nasal endoscopy in patients with a prior history of endoscopic sinus surgery. *Int Forum Allergy Rhinol*. 2012;2(6):453-459.
 18. Sie KC, Starr JR, Bloom DC, et al. Multicenter interrater and intrarater reliability in the endoscopic evaluation of velopharyngeal insufficiency. *Arch Otolaryngol Head Neck Surg*. 2008;134(7):757-763.
 19. Symvoulakis EK, Klinis S, Alegakis A, et al. Epidemiologic profile of otorhinolaryngological, head and neck disorders in a tertiary hospital unit in Greece: a challenge for general practitioners? *BMC Ear Nose Throat Disord*. 2006;6:12.
 20. Rourke T, Tassone P, Philpott C, Bath A. ENT cases seen at a local "walk-in centre": a one year review. *J Laryngol Otol*. 2009;123(3):339-342.
 21. Kaplowitz MD, Hadlock TD, Levine R. A comparison of web and mail survey response rates. *Public Opin Q*. 2004;68(1):94-101.
 22. Zhang Y. Using the internet for survey research: a case study. *J Am Soc Info Sci*. 1999;51(1):57-68.
 23. Sommers BD, Bindman AB. New physicians, the Affordable Care Act, and the changing practice of medicine. *J Am Med Assoc*. 2012;307(16):1697-1698.